# CHLOROACETIC ACID

Chloroacetic acid is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 79-11-8 $ClCH_2CO_2H$

Molecular Formula: $C_2H_3ClO_2$

Chloroacetic acid is a colorless to white crystalline solid which exists in the alpha, beta, and gamma forms. It is soluble in water, alcohol, benzene, chloroform, ether, carbon disulfide, ethanol, and diethyl ether. Chloroacetic acid absorbs water from the air and forms a syrup (HSDB, 1991). It is incompatible with alkalies and is combustible when exposed to heat or flame (Sax, 1989; Sittig, 1985).

**Physical Properties of Chloroacetic Acid**

Synonyms: chloroethanoic acid; monochloroacetic acid; monochloroethanoic acid

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| Molecular Weight: | 94.5 |
| Boiling Point: | 189 °C (all forms) |
| Melting Point: | 63 °C (alpha) |
| | 55 - 56 °C (beta) |
| | 50 °C (gamma) |
| Flash Point: | 259 °F |
| Vapor Density: | 3.26 (air = 1) |
| Density/Specific Gravity: | 1.4043 at 40/4 °C (water=1) |
| Vapor Pressure: | 1.00 mm Hg at 43 °C |
| Log Octanol/Water Partition Coefficient: | 0.22 |
| Conversion Factor: | 1 ppm = 3.86 $mg/m^3$ |

(HSDB, 1991; Merck, 1989; U.S. EPA, 1994a)

## SOURCES AND EMISSIONS

A. Sources

Chloroacetic acid is used as a chemical intermediate in the manufacture of 2,4-dichlorophenoxyacetic acid, 2,4,5-trichlorophenoxyacetic acid, carboxymethyl cellulose, and other chemicals (HSDB, 1991).

The primary sources of chloroacetic acid emissions in California reported in the United States Environmental Protection Agency's (U.S. EPA) 1995 Toxics Release Inventory (TRI) Public Data Release Report were the chemical and allied products industries (U.S. EPA, 1996b).

B. Emissions

In California, approximately 1,500 pounds of chloroacetic acid emissions were reported in the U.S. EPA 1995 TRI Public Data Release Report (U.S. EPA, 1996b).

C. Natural Occurrence

No information about the natural occurrence of chloroacetic acid was found in the readily-available literature.

## AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of chloroacetic acid.

## INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of chloroacetic acid was found in the readily-available literature.

## ATMOSPHERIC PERSISTENCE

No information on the atmospheric half-life and lifetime was found in the readily-available literature. If chloroacetic acid is used as a pesticide, it could possibly be released to the atmosphere associated with aerosols and sprays. Chloroacetic acid will therefore be removed from the atmosphere through the wet and dry deposition of aerosols and particles (Atkinson, 1995; HSDB, 1991).

## AB 2588 RISK ASSESSMENT INFORMATION

Chloroacetic acid emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

## HEALTH EFFECTS

Probable routes of human exposure to chloroacetic acid are inhalation and dermal contact (U.S. EPA, 1994a).

Non-Cancer: Exposure to chloroacetic acid may cause severe irritation to the skin, eyes, and respiratory tract. Chloroacetic acid is a central nervous system depressant. Studies have reported that mice exposed to acute inhalation exposures of chloroacetic acid exhibited neurological dysfunction. Damage to the respiratory tract has been observed in rodents chronically exposed to chloroacetic acid by inhalation, orally, and via gavage (Sittig, 1991; U.S. EPA, 1994a).

The U.S. EPA has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for chloroacetic acid. However, they have calculated a provisional RfD of 0.002 milligrams per kilogram per day. The U.S. EPA estimates that consumption of this dose or less, over a lifetime, would not likely result in the occurrence of chronic, non-cancer effects (U.S. EPA, 1994a).

No information is available on the adverse developmental or reproductive effects of chloroacetic acid in humans or animals (U.S. EPA, 1994a).

Cancer: No information is available on the carcinogenic effects of chloroacetic acid in humans. Chloroacetic acid was not found to be tumorigenic to mice or rats when administered via gavage or by subcutaneous injection or when applied to the skin. The U.S. EPA has classified chloroacetic acid as Group D: Not classifiable as to human carcinogenicity (U.S. EPA, 1994a). The International Agency for Research on Cancer has not classified chloroacetic acid as to its carcinogenicity (IARC, 1987a).